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Step by step approach to create Timer Job Using SharePoint Apps

Jabeen Begum, 4 Feb 2015

CPOL

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Create a timer job using SharePoint App model, CSOM and azure webjobs

Introduction

In SharePoint you can use timer jobs to perform scheduled tasks. These timer jobs are farm solutions or full trust solutions which needs to be deployed in SharePoint server and need to run with farm account. If we want to achieve the same functionality of timer job in SharePoint Online or any hosted environment, it is not possible as we cannot deploy farm solutions in SharePoint online and hosted environments.

Without writing farm solutions you can still achieve the functionality of timer jobs using SharePoint Apps by writing the code in operations supported by CSOM and schedule the task can be done using windows task for on premise or Azure Webjobs for cloud.

SharePoint Apps: SharePoint apps are solutions that are easy to install and uninstall and apps are hosted either client side or in cloud but not on SharePoint server..

Azure Webjobs: Azure Webjobs is a new feature of Azure websites that allow you to run programs or tasks at regular intervals. You can schedule the job to run continuously or on a particular schedule or can run on demand.

Scheduling – For on premises scheduling of the job can be done using Windows Task and for scheduling in cloud you can use new Webjobs capability of Azure websites.

Pre-requisites for this sample

- Developer site – can be on premise SharePoint site or an Office 365 developer site.
- A subscription to Microsoft Azure

To achieve this functionality we need a **SharePoint App** and a **console application**.

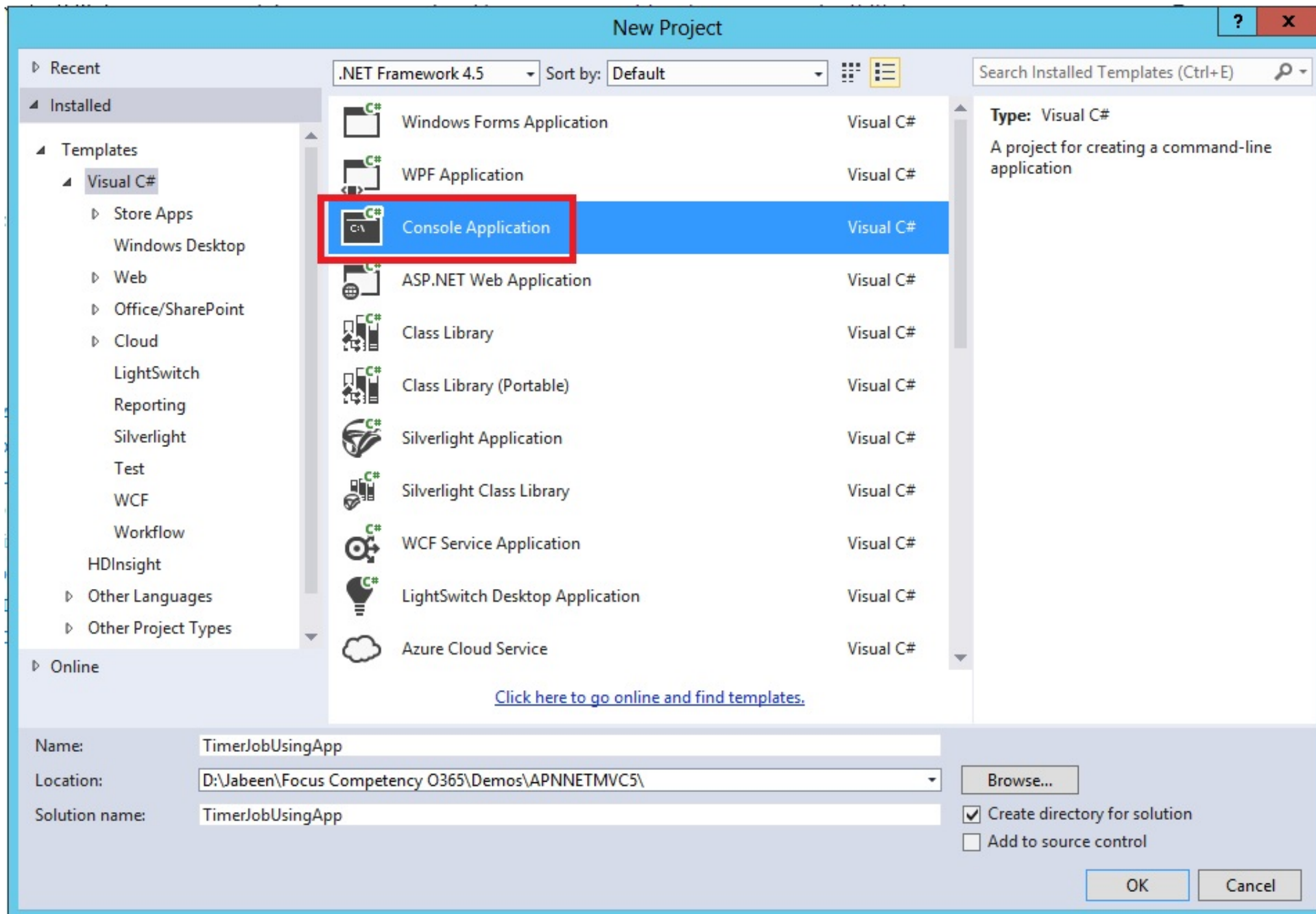
SharePoint app will handle the authentication and assigns permissions required to connect and access the SharePoint site.

Console application will contain the logic that needs to be executed as per schedule.

Step - 1: Create a console application.

To create a console application, launch visual studio as a administrator and click on

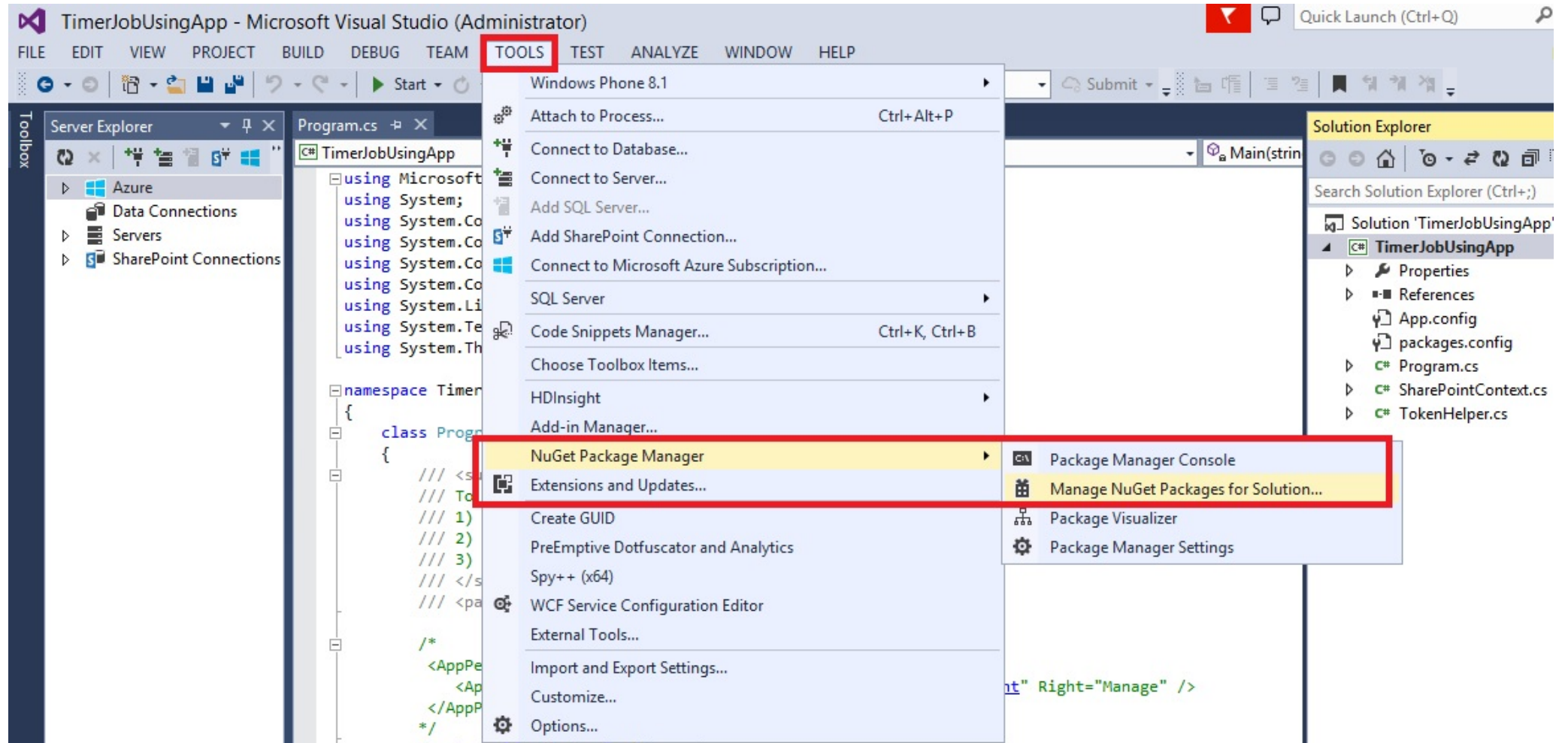
File ->New ->Project ->Visual C# -> and select **Console Application**.

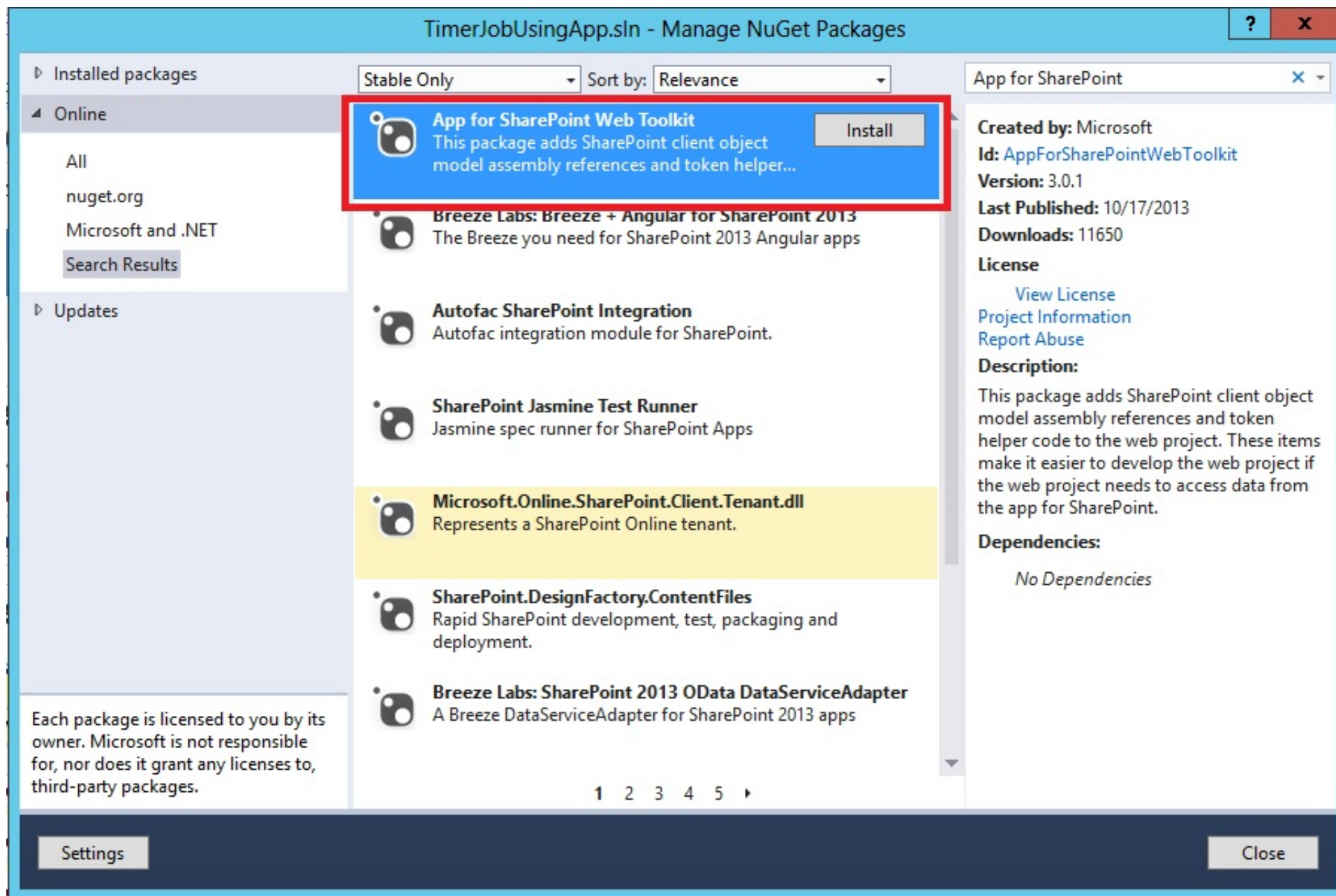


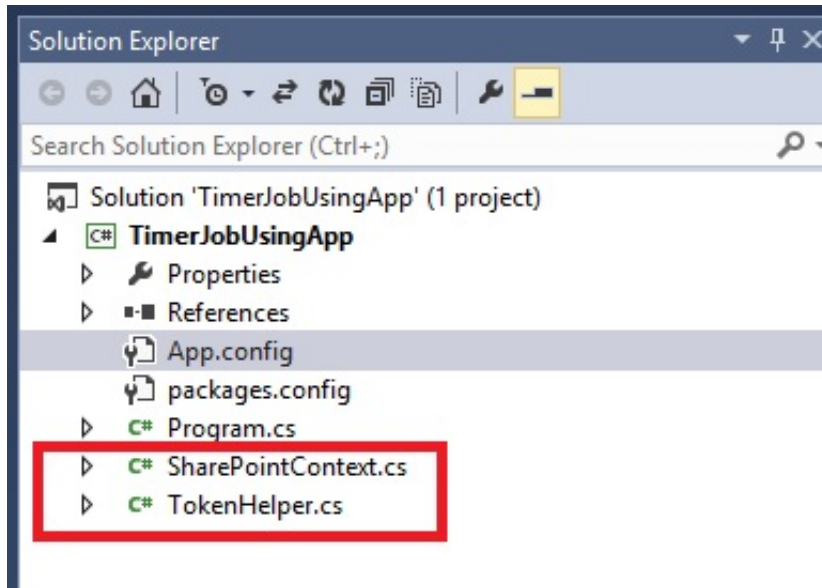
Step -2: Add the Nuget packages

From Visual Studio- navigate to **Tools -> Nuget Package Manager ->** and select **"Manage NuGet Packages for Solution"** as shown in the below.

Select **"Nuget.org"** and search for **"App for SharePoint Web Toolkit"** and click on **"Install"**. This will add **"TokenHelper.cs"** and **"SharePointContext.cs"** classes to the solution. TokenHelper and SharePointContext classes help the console application in getting access to SharePoint site using client id and client secret.







Step -3: Write the code in console application

Write the code that needs to be executed by the job in "**Program.cs**" using CSOM . You can perform the operations supported using CSOM. The following sample creates a list if it does not exists and creates items. You can write any logic that needs to be executed by the job.

Add the following code in Program.cs

Hide Shrink ▲ Copy Code

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using Microsoft.SharePoint.Client;
using System.Configuration;
using System.Collections.Specialized;
using System.IO;
using System.Security;

namespace ConsoleApp
{
    class Program
    {
        static void Main(string[] args)
        {
            var config = (NameValueCollection)ConfigurationManager.GetSection("Sites");
```

```
foreach (var key in config.Keys)
{
    Uri siteUri = new Uri(config.GetValues(key as string)[0]);
    string listname = "My List";
    string realm = TokenHelper.GetRealmFromTargetUrl(siteUri);
    string accessToken = TokenHelper.GetAppOnlyAccessToken(
        TokenHelper.SharePointPrincipal,
        siteUri.Authority, realm).AccessToken;

    using (var clientContext =
        TokenHelper.GetClientContextWithAccessToken(
            siteUri.ToString(), accessToken))
    {
        CheckListExists(clientContext, listname);
        AddListItem(clientContext, listname);
    }
}

private static void CheckListExists(ClientContext clientContext, string listName)
{
    ListCollection listCollection = clientContext.Web.Lists;
    clientContext.Load(listCollection, lists => lists.Include(list => list.Title).Where(list => list.Title == listName));
    clientContext.ExecuteQuery();
    if (listCollection.Count <= 0)
    {
        CreateList(clientContext, listName);
    }
}

private static void CreateList(ClientContext clientContext, string listName)
{
    Web currentWeb = clientContext.Web;
    ListCreationInformation creationInfo = new ListCreationInformation();
    creationInfo.Title = listName;
    creationInfo.TemplateType = (int)ListTemplateType.GenericList;
    List list = currentWeb.Lists.Add(creationInfo);
    list.Description = "My custom list";
    list.Update();
    clientContext.ExecuteQuery();
}

private static void AddListItem(ClientContext clientContext, string listName)
{
    Web currentWeb = clientContext.Web;
    var myList = clientContext.Web.Lists.GetByTitle(listName);
    ListItemCreationInformation listItemCreate = new ListItemCreationInformation();
    Microsoft.SharePoint.Client.ListItem newItem = myList.AddItem(listItemCreate);
    newItem["Title"] = "Item added by Job at " + DateTime.Now;
    newItem.Update();
}
```

```

    clientContext.ExecuteQuery();
  }
}
}






























```

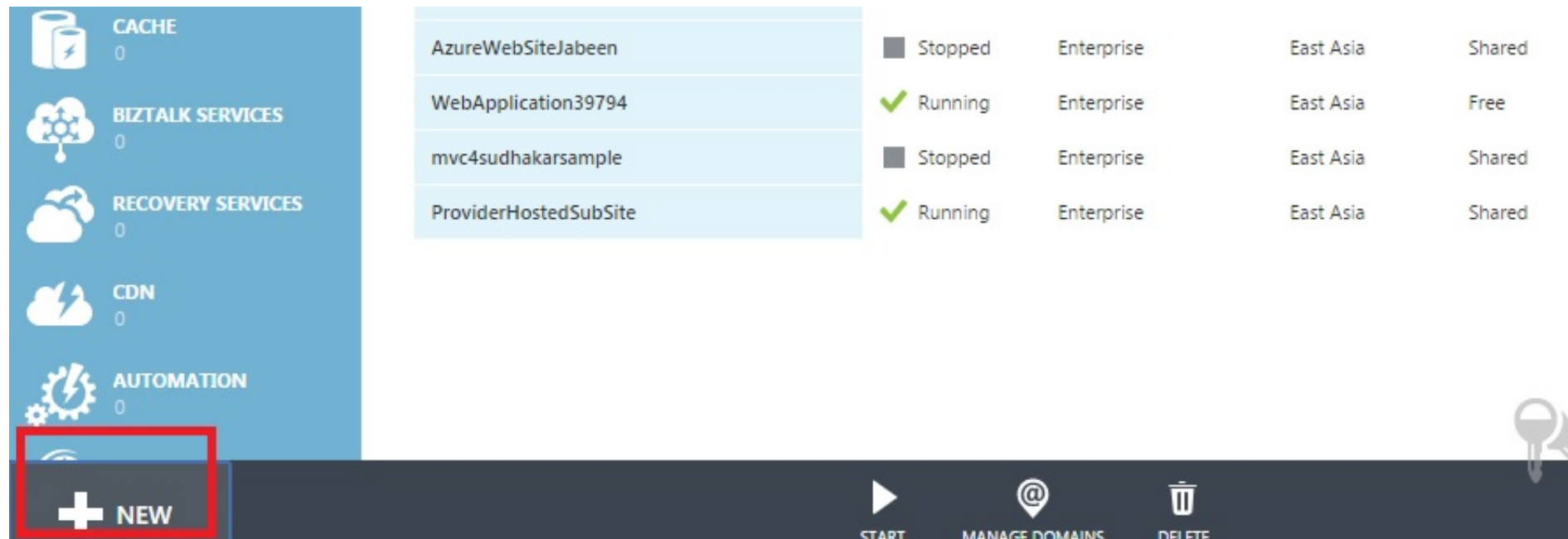
Step -4: Create a website in Windows Azure

Use Azure WebJobs feature of Azure websites for scheduling the job. So let's create an Azure website first.

To create a new website, log in to Azure management portal <http://manage.windowsazure.com/>.

Click the **"NEW"** -> select **"WEBSITE"** -> select **"QUICK CREATE"** and enter the URL -> and click **"CREATE WEBSITE"**.

WEBSITES 19		NAME	STATUS	SUBSCRIPTION	LOCATION	MODE
		Sudhakar-Web →	 Stopped	Enterprise	East Asia	Shared
		sudhakar-test2	 Stopped	Enterprise	East Asia	Shared
		AzureApps	 Running	Enterprise	East Asia	Shared
		JabeenAzureWebSite	 Running	Enterprise	East Asia	Shared
		ashokwordpressblog	 Stopped	Enterprise	East Asia	Shared
		AzureSiteForTimerJob	 Running	Enterprise	East Asia	Shared
		AzureSiteforProviderHostedApp	 Running	Enterprise	East Asia	Shared
		Job1	 Running	Enterprise	East Asia	Shared
		Office365APIWebApp	 Running	Enterprise	East Asia	Free
		SiteToRunMyTimerJob	 Running	Enterprise	East Asia	Shared
		WebJobSampleSite	 Running	Enterprise	East Asia	Shared
		Sussite	 Running	Enterprise	East Asia	Shared
		SubSiteCreationUsingAppModel	 Running	Enterprise	East Asia	Shared
		WebApplication43288	 Running	Enterprise	East Asia	Free
		fieldserviceoffline	Running	Enterprise	East Asia	Shared



The screenshot displays the Azure portal interface. On the left, a blue sidebar contains icons and labels for various services: CACHE, BIZTALK SERVICES, RECOVERY SERVICES, CDN, and AUTOMATION. The 'NEW' button, represented by a plus sign icon, is highlighted with a red rectangular box. The main content area shows a table of web applications with the following data:

Web Application Name	Status	Subscription	Region	Quota
AzureWebSiteJabeen	Stopped	Enterprise	East Asia	Shared
WebApplication39794	Running	Enterprise	East Asia	Free
mvc4sudhakarsample	Stopped	Enterprise	East Asia	Shared
ProviderHostedSubSite	Running	Enterprise	East Asia	Shared

At the bottom of the screen, a dark blue navigation bar contains icons for 'START', 'MANAGE DOMAINS', and 'DELETE'. A red box highlights the 'NEW' button in the left sidebar.

Microsoft Azure

Subscriptions

ALL ITEMS

WEBSITES 19

VIRTUAL MACHINES 2

MOBILE SERVICES 0

CLOUD SERVICES 11

SQL DATABASES 5

STORAGE 8

websites

NAME	STATUS	SUBSCRIPTION	LOCATION	MODE	URL
Sudhakar-Web	Stopped	Enterprise	East Asia	Shared	sudhakar-web.azurewebsites.net
sudhakar-test2	Stopped	Enterprise	East Asia	Shared	sudhakar-test2.azurewebsites.net
AzureApps	Running	Enterprise	East Asia	Shared	azureapps.azurewebsites.net
JabeenAzureWebSite	Running	Enterprise	East Asia	Shared	jabeenazurewebsite.azurewebsites.net
ashokwordpressblog	Stopped	Enterprise	East Asia	Shared	ashokwordpressblog.azurewebsites.net
AzureSiteForTimerJob	Running	Enterprise	East Asia	Shared	azuresitefortimerjob.azurewebsites.net
AzureSiteforProviderHostedApp	Running	Enterprise	East Asia	Shared	azuresiteforproviderhostedapp.azurewebsites.net
Job1	Running	Enterprise	East Asia	Shared	job1.azurewebsites.net

NEW

COMPUTE

DATA SERVICES

APP SERVICES

NETWORK SERVICES

MARKETPLACE PREVIEW

WEBSITE

VIRTUAL MACHINE

MOBILE SERVICE

CLOUD SERVICE

BATCH SERVICE PREVIEW

QUICK CREATE

CUSTOM CREATE

FROM GALLERY

URL

AzureSiteForTimerJob

.azurewebsites.net

WEB HOSTING PLAN

Default1 (East Asia, Shared)

SUBSCRIPTION

Enterprise (016f09ac-4b48-453f-8fff-7bfc8d244)

Now we are done with creating a console application and we have an azure website. Now we need an app. You can create a provider hosted app using Visual studio. When you develop an app using Visual studio and when you hit F5, visual studio will take care of app registration. This means it will generate the client id and secret and update the web.config of the provider hosted app web. This works for development environment. If you want to deploy our app to a different site then we need to register the app using /_layouts/15/appregnew.aspx. Since we don't need any UI and we need app just for getting client id and client secret which will be used by the console application for getting access

to SharePoint site. Let not create a provider hosted app instead let just register the app and use the secret in console application.

Step -5: App Registration

To register an app we need to follow the below steps

- a. Go to `/_layouts/15/appregnew.aspx` and create a client id and client secret.
- b. Provide permissions using `/_layouts/15/appinv.aspx`.
- c. Update the `app.config` of console application with client id and secret

Follow the below steps to register app using `/_layouts/15/appregnew.aspx` page of the Sharepoint site.

- a. Navigate to the following url `https://<yoursharepointsitenam>/sites/DevSite1/_layouts/15/appregnew.aspx`
- b. Click on "**Generate**" button to generate a client id.
- c. Click on "**Generate**" to get client secret.
- d. Enter a name for the app in "**Title**"
- e. In App Domain – for on premise SharePoint site enter the App Domain name. For SharePoint online enter the name of the site we just created using Azure Portal.
- f. Click "**Create**"

Office 365 | Sites

DevSite1 EDIT LINKS

Home
Notebook
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Samples
Developer Center
Recent
TimerJobUsingAppModel
SharePointApp6
SharePointApp1
SharePointApp10
SharePointApp8
Site Contents
Recycle Bin
EDIT LINKS

App Information
The app's information, including app id, secret, title, hosting url and redirect url.

App Type:
☒ An app running on a web server
☐ An app running on a client machine

Client Id:
3cbb925d-a4fc-4165-8e9e-a8ffde15

Client Secret:
Z8m50FSRnHaWwtS+ANJrTpxOelgo

Title:
Timer Job Using App

App Domain:
azuresitefortimerjob.azurewebsites.net
Example: "www.contoso.com"

Redirect URI:

Example: "https://www.contoso.com/default.aspx"

g. Copy the Client Id and Client secret created. We need to update these details in app.config file

DevSite1

 EDIT LINKS

The app identifier has been successfully created.

Client Id: 3cbb925d-a4fc-4165-8e9e-a8ffde15b0b

Client Secret: Z8m50FSRnHaWwtS+ANJrTpxOelgozK9teymEps+6kfo=

Title: Timer Job Using App

App Domain: azuresitefortimerjob.azurewebsites.net

Redirect URI:

h. Provide **App permissions** by using `/_layouts/15/AppInv.aspx`. Follow the below steps to provide permissions to app to access SharePoint site.

- Navigate to the url. `https://<yoursharepointsitename>/sites/DevSite1/_layouts/15/appregnew.aspx`
- Paste the "**Client id**" generated in app registration page and click on "**Lookup**". This will populate the details of the app in other textboxes.
- Enter the following XML in "**App's permission request XML**" textbox. This will add permissions to the app.


[Hide](#) [Copy Code](#)

```
<AppPermissionRequests AllowAppOnlyPolicy="true">
  <AppPermissionRequest Scope="http://sharepoint/content/tenant" Right="Manage" />
</AppPermissionRequests>
```


Office 365

Sites

SHARE FOLLOW



DevSite1

EDIT LINKS

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Recent

TimerJobUsingAppModel

SharePointApp6

SharePointApp1

SharePointApp10

SharePointApp8

Site Contents

Recycle Bin

EDIT LINKS

App Id and Title

The app's identity and its title.

App Id:

3cbb925d-a4fc-4165-

Lookup

Title:

Timer Job Using App

App Domain:

azuresitefortimerjob.azurewebsites.net

Example: "www.contoso.com"

Redirect URL:

Example: "https://www.contoso.com/default.aspx"

App's Permission Request XML

The permission required by the app.

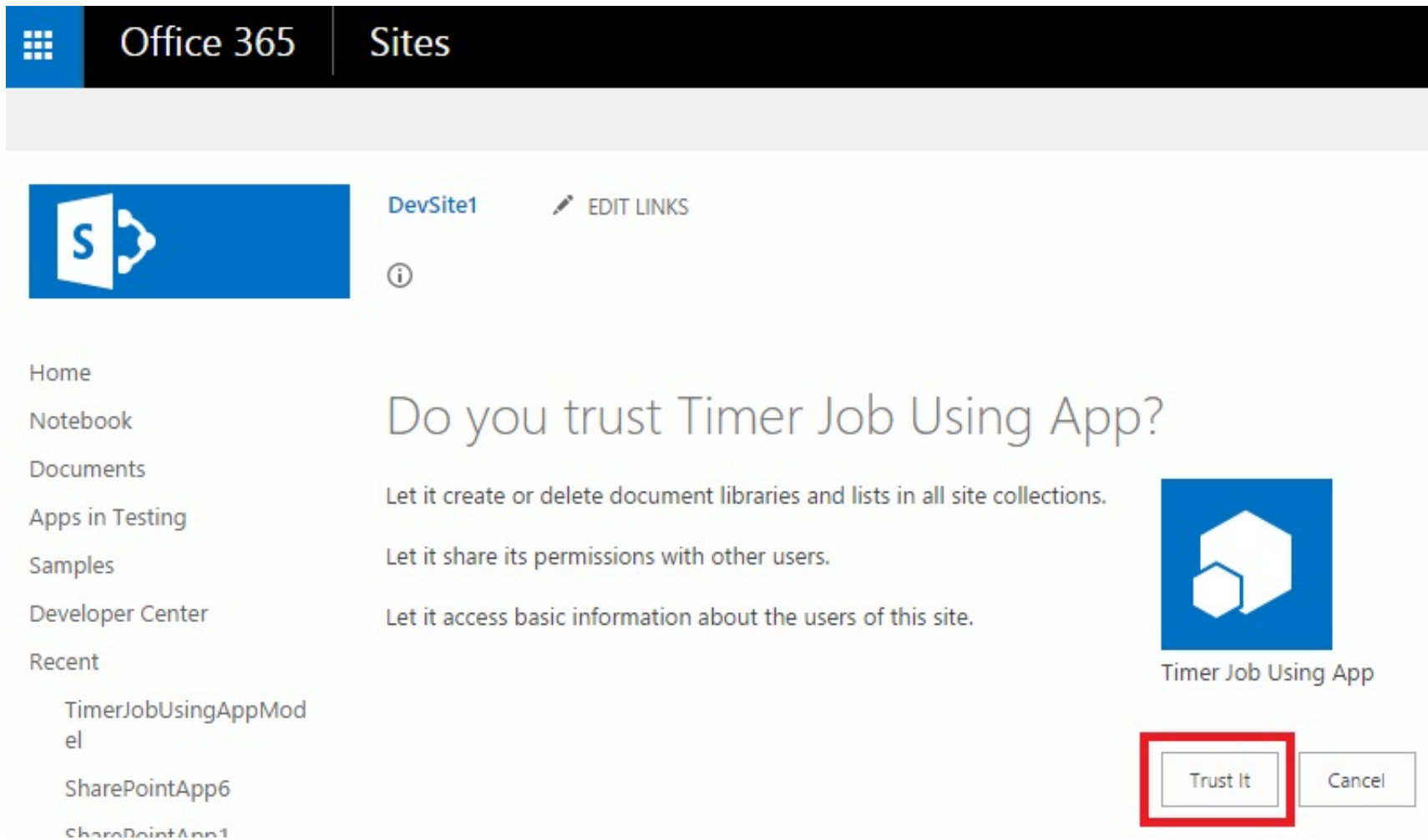
Permission Request XML:

```
<AppPermissionRequests
  AllowAppOnlyPolicy="true">
  <AppPermissionRequest
    Scope="http://sharepoint/content/tenant
    " Right="Manage" />
  </AppPermissionRequests>
```

Create

Cancel

i. Trust the App to get necessary permissions



j. Update the **App.Config** of the console application and copy the "**Client Id**" and "**client secret**" generated in the app registration step. Console application will use the client id and secret to authenticate and get access/connect to SharePoint.

Hide Copy Code

```
<configuration>
  <configSections>
    <section name="Sites"
      type="System.Configuration.NameValueSectionHandler"/>
  </configSections>
  <Sites>
    <add key="site2"
      value="https://XXX.sharepoint.com/sites/DevSite1/" />
  </Sites>
</configuration>
```

```












<appSettings>
  <add key="ClientId" value="64d869cf-05b1-44a2-9557-ab8f0a756218"/>
  <add key="ClientSecret" value="zZUV7HuLS07Hb9z1T2NV+QWFxMwHLxcx5ov4A525p5A="/>
</appSettings>
<startup>
  <supportedRuntime version="v4.0" sku=".NETFramework,Version=v4.5" />
</startup>
</configuration>




```

Step -6: Schedule the timer job.

You can schedule the timer job using Windows task for on premise or for cloud can use Azure Webjobs for scheduling the job. You can publish directly from Visual Studio or create webjob and upload the zip file in Azure Portal.

Create the WebJob and upload the Zip file in Azure Portal – to publish to windows azure web jobs, build the project. Go to **bin-> Debug**.

Name	Date modified	Type	Size
 Microsoft.IdentityModel.dll	7/25/2012 9:51 PM	Application extens...	1,068 KB
 Microsoft.IdentityModel.Extensions.dll	8/31/2012 12:20 AM	Application extens...	59 KB
 Microsoft.SharePoint.Client.dll	8/1/2014 2:17 AM	Application extens...	460 KB
 Microsoft.SharePoint.Client.Runtime.dll	1/23/2014 5:53 AM	Application extens...	283 KB
 Microsoft.SharePoint.Client.Runtime	9/29/2012 3:11 PM	XML File	61 KB
 Microsoft.SharePoint.Client	9/29/2012 3:11 PM	XML File	187 KB
 TimerJobUsingApp	1/27/2015 2:43 PM	Application	39 KB
 TimerJobUsingApp.exe	1/27/2015 2:43 PM	CONFIG File	1 KB
 TimerJobUsingApp	1/27/2015 2:43 PM	Program Debug D...	82 KB
 TimerJobUsingApp.vshost	1/27/2015 2:46 PM	Application	23 KB
 TimerJobUsingApp.vshost.exe	1/27/2015 2:43 PM	CONFIG File	1 KB

 Debug	1/23/2015 2:21 PM	File folder	
 Release	1/22/2015 11:51 AM	File folder	
 TimerJobBuidOutput	1/23/2015 8:07 PM	Compressed (zipp...	710 KB

a. Create a Zip file of the build output of the console application

b. Go to Azure Management Portal à Websites à Click on the website you want to use for scheduling the job

Microsoft Azure | ▾

Subscriptions ▾

azuresitefortimerjob

DASHBOARD MONITOR **WEBJOBS** CONFIGURE SCALE LINKED RESOURCES BACKUPS

☒ CPU TIME
 ☒ DATA IN
 ☒ DATA OUT
 ☒ HTTP SERVER ERRORS
 ☒ REQUESTS
 RELATIVE ▾ 1 HOUR ▾ ↺

11:45 11:50 11:55 12:00PM 12:05 12:10 12:15 12:20 12:25 12:30 12:35 12:40 12:45

web endpoint status PREVIEW

You have not configured a web endpoint for monitoring. Configure one to get started.

CONFIGURE WEB ENDPOINT MONITORING →

autoscale status

With a Standard website, you can configure autoscale and spend only as much as you need for your service.

CONFIGURE AUTOSCALE →

AUTOSCALE OPERATION LOGS →

usage overview

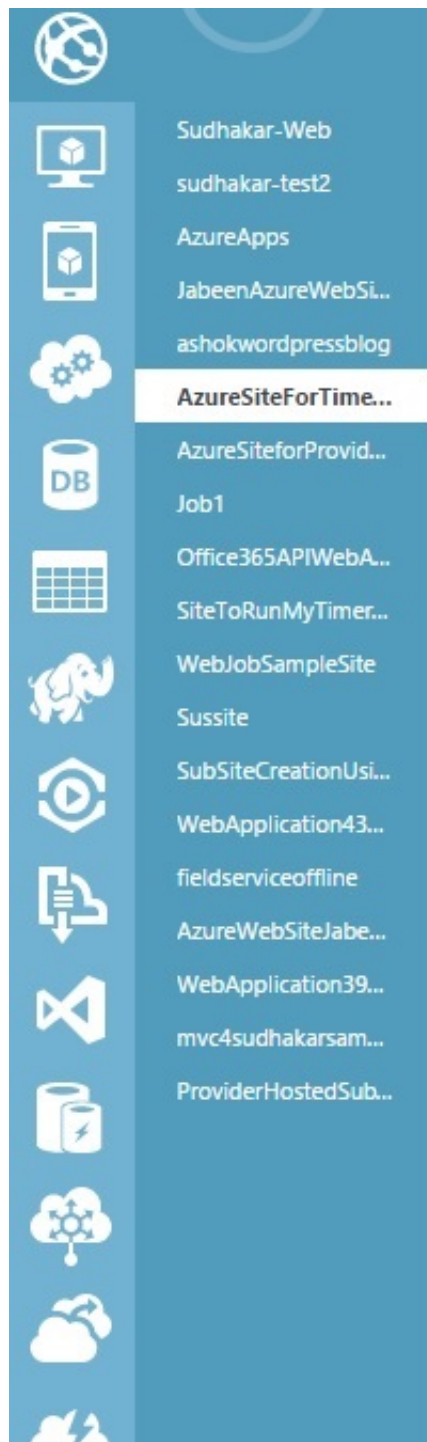
■ AZURESITEFORTIMERJOB ■ OTHER WEBSITES ■ AVAILABLE

quick glance

- Visit the new portal PREVIEW
- View Applicable Applications and services
- View connection strings
- Download the publish profile
- Set up deployment credentials
- Reset your publish profile credentials
- Set up deployment from source control
- Add a new deployment slot PREVIEW

STATUS

c. Click on **WebJobs à** and click on **"Add"** to create a new web job



DASHBOARD

MONITOR

WEBJOBS

CONFIGURE

SCALE

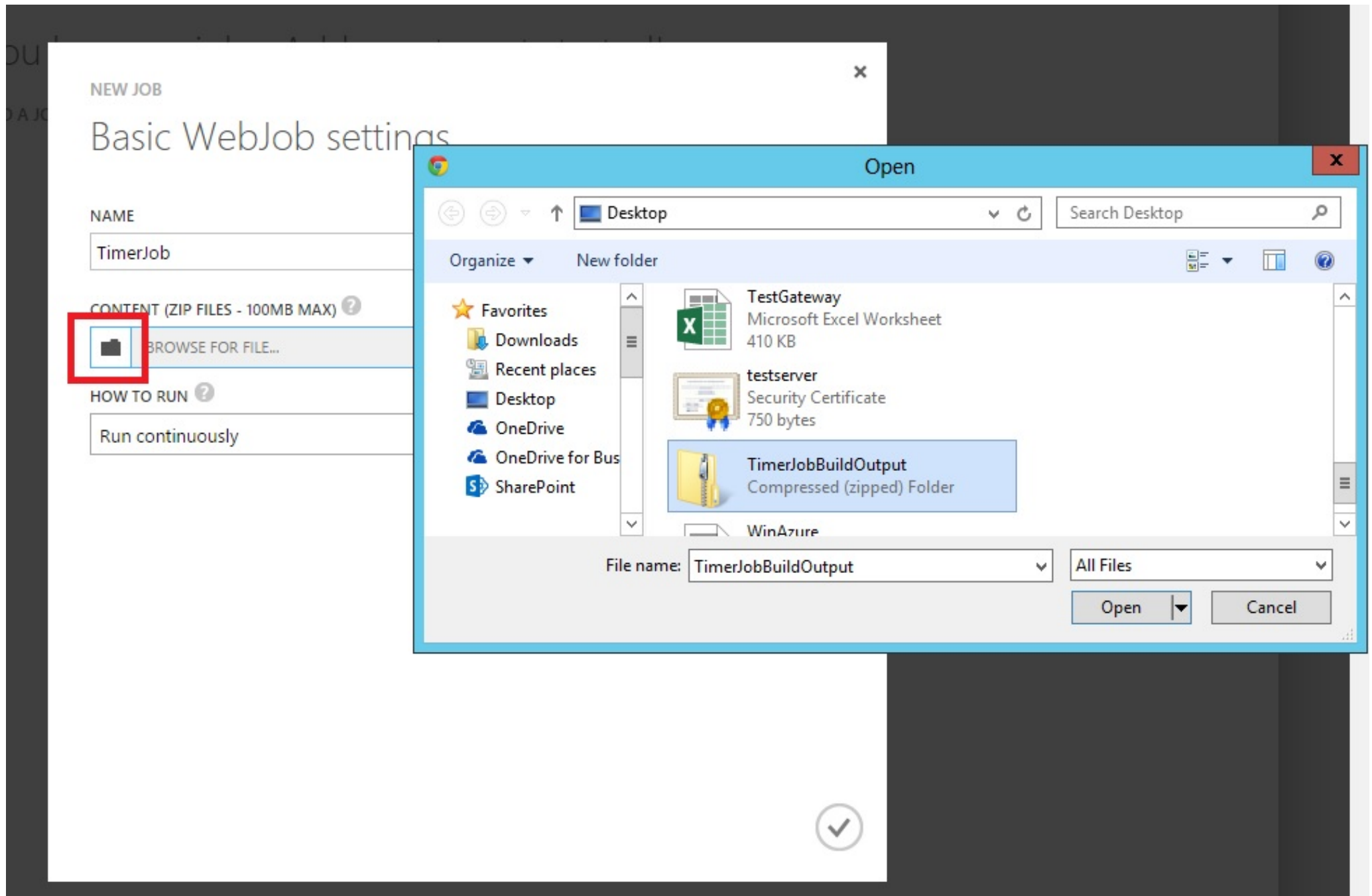
LINKED RESOURCES

BACKUPS

You have no jobs. Add one to get started!

ADD A JOB





e. You can schedule it to

- a. **"Run Continuously"** – after completing it will start and run again.
- b. Or create a schedule by using **"Run on Schedule"** – run on the schedule.
- c. Or use **"Run on Demand"** – run whenever you want


NEW JOB

Basic WebJob settings

NAME


TimerJob

CONTENT (ZIP FILES - 100MB MAX) ?

 TimerJobBuildOutput.zip

HOW TO RUN ?

- Run continuously ▼
- Run continuously
- Run on a schedule
- Run on demand



f. This will create a new job, you can check the notification as shown below. To run the job click on **"RUN ONCE"**

The screenshot displays the SharePoint Timer Job interface. On the left is a navigation pane with various site icons and names. The main area shows a table of timer jobs. The 'TimerJob' is highlighted, with its 'On demand' schedule type circled in red. At the bottom, a dark blue banner contains a green checkmark and the message 'Successfully uploaded new job: 'TimerJob''. Below this banner is a toolbar with buttons for '+ NEW', '+ ADD', 'RUN ONCE' (circled in red), and 'DELETE'. On the right side of the banner, there are links for 'Activate Windows', 'Go to Action Center to activate Windows', and a 'DETAILS' link with an information icon.

NAME	STATUS	SCHEDULE	LAST RUN TIME	LAST RUN RESULT	LOGS
TimerJob	✓ Enabled	On demand			https://azuresitefortimerjob

✓ Successfully uploaded new job: 'TimerJob'.

+ NEW + ADD **RUN ONCE** DELETE

Activate Windows
Go to Action Center to activate Windows

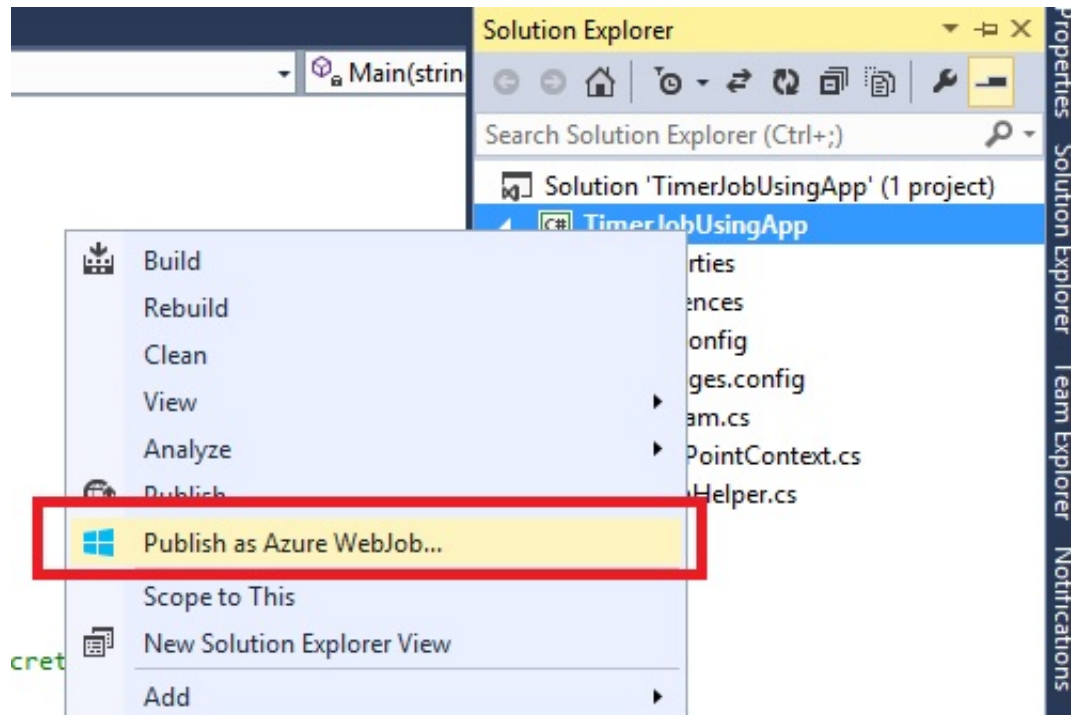
DETAILS OK ?

g. Upon successful execution it will show the message




Step -7: You can Publish the job directly from Visual Studio

To Publish from Visual Studio, right click project and select “**Publish as Azure Website**”



a. It will launch the “**Add Azure Webjob**” dialog. Enter name of the job and schedule details

Add Azure WebJob



Microsoft Azure WebJobs

Project name:

TimerJobUsingApp

WebJob name:

TimerJobUsingAppfroVS

WebJob run mode:

Run on a Schedule

Recurrence:

Recurring Job ☐ No end date

Recur every:

2 Days

Starting on:

January 2015

Su	Mo	Tu	We	Th	Fr	Sa
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

Starting time:

5:30 PM

Starting time zone:

(UTC+05:30) Chennai, Kolkata, Mumbai, N

Ending on:

January 2015

Su	Mo	Tu	We	Th	Fr	Sa
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

Ending time:

12:00 AM

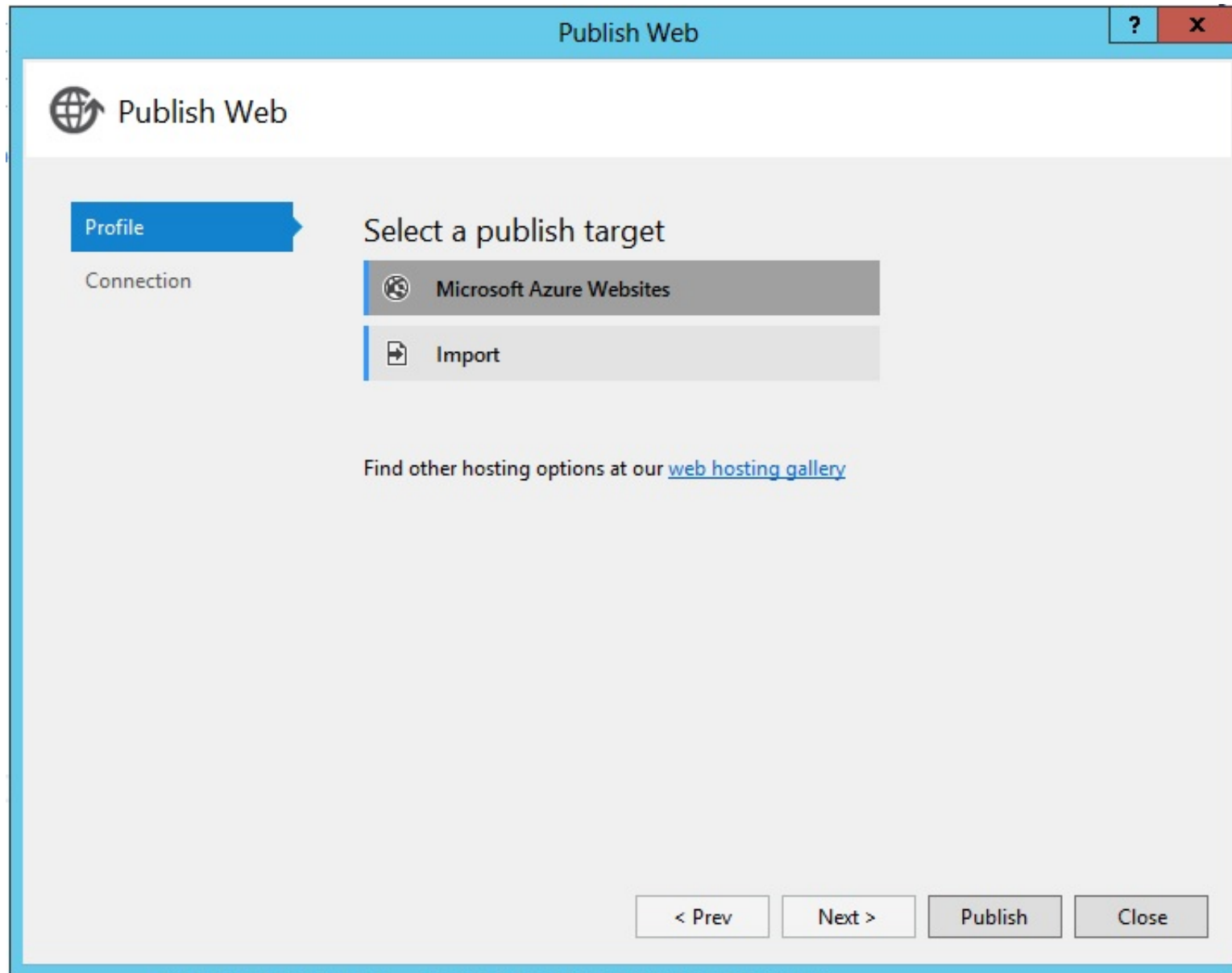
Ending time zone:

(UTC+05:30) Chennai, Kolkata, Mumbai, N

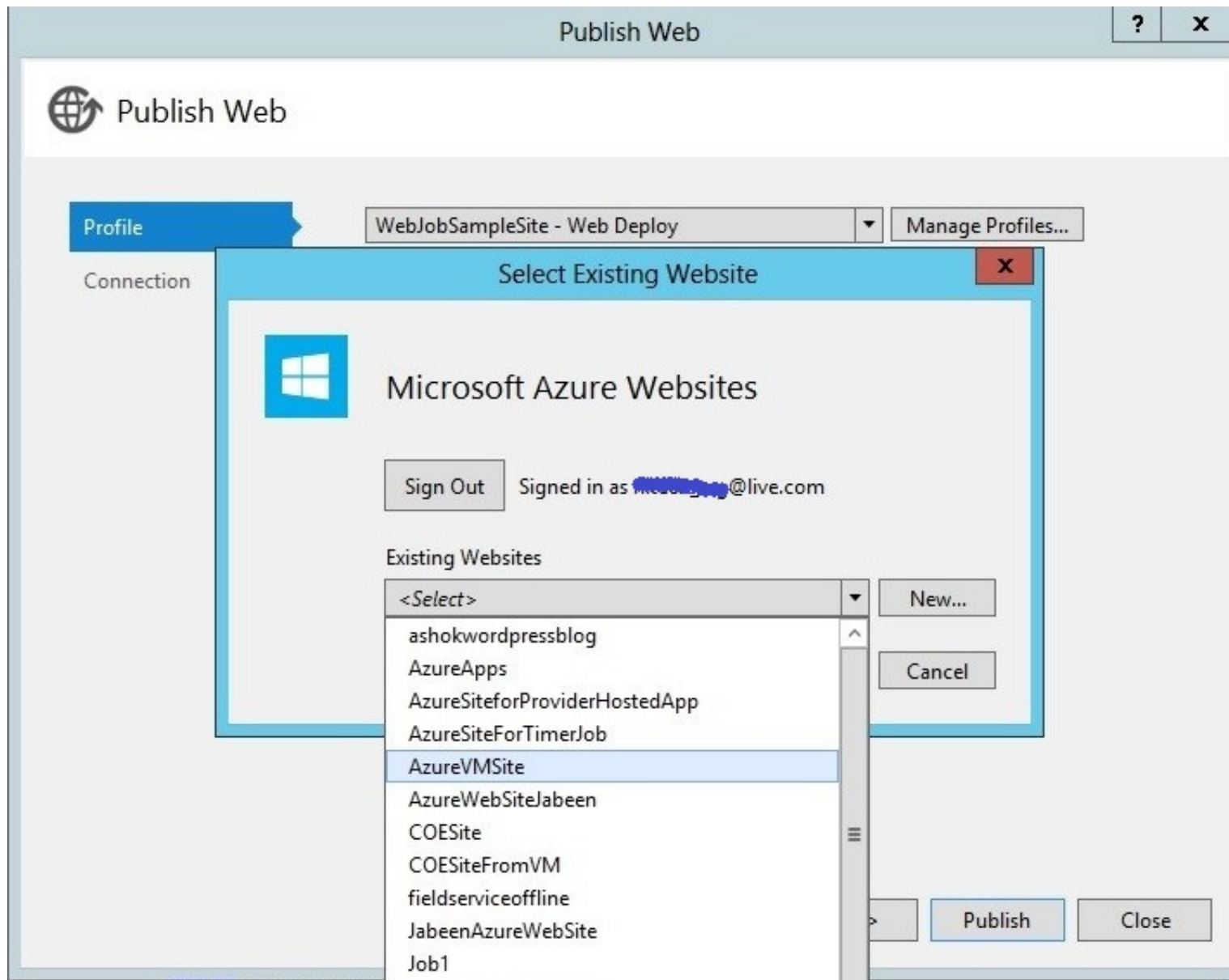
[Learn more](#)

OK Cancel

b. After clicking "OK" it will add the Nuget packages and then will launch the "Publish Web" dialog. You can select "Publish Target". Click on "Microsoft Azure Websites" to publish to Windows Azure.

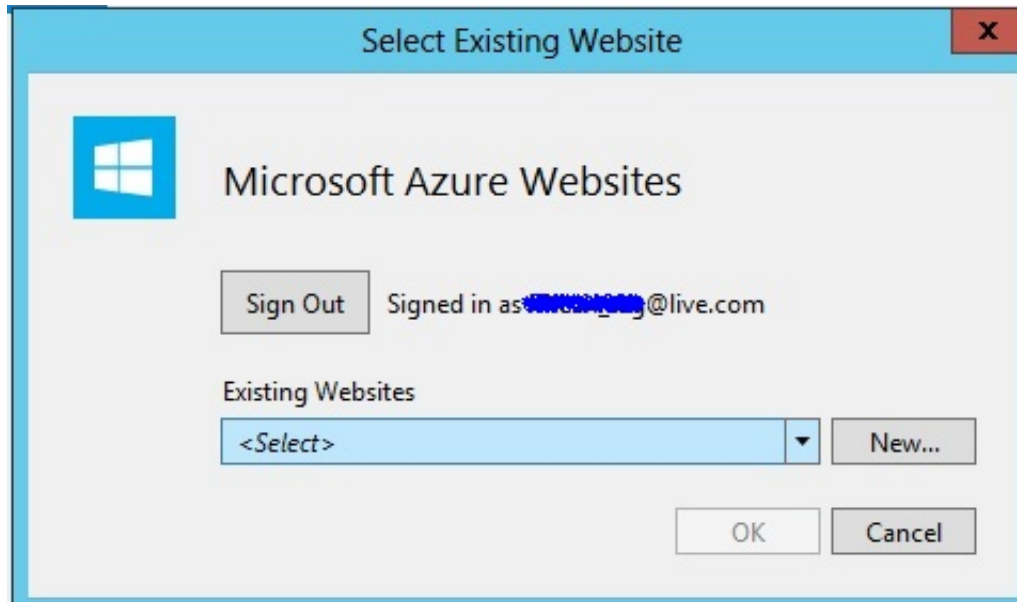


c. It will launch the “**Select Existing Website**” dialog. You can select and Existing Website in Azure or create a new website. To select an existing website select the site name from the dropdown.

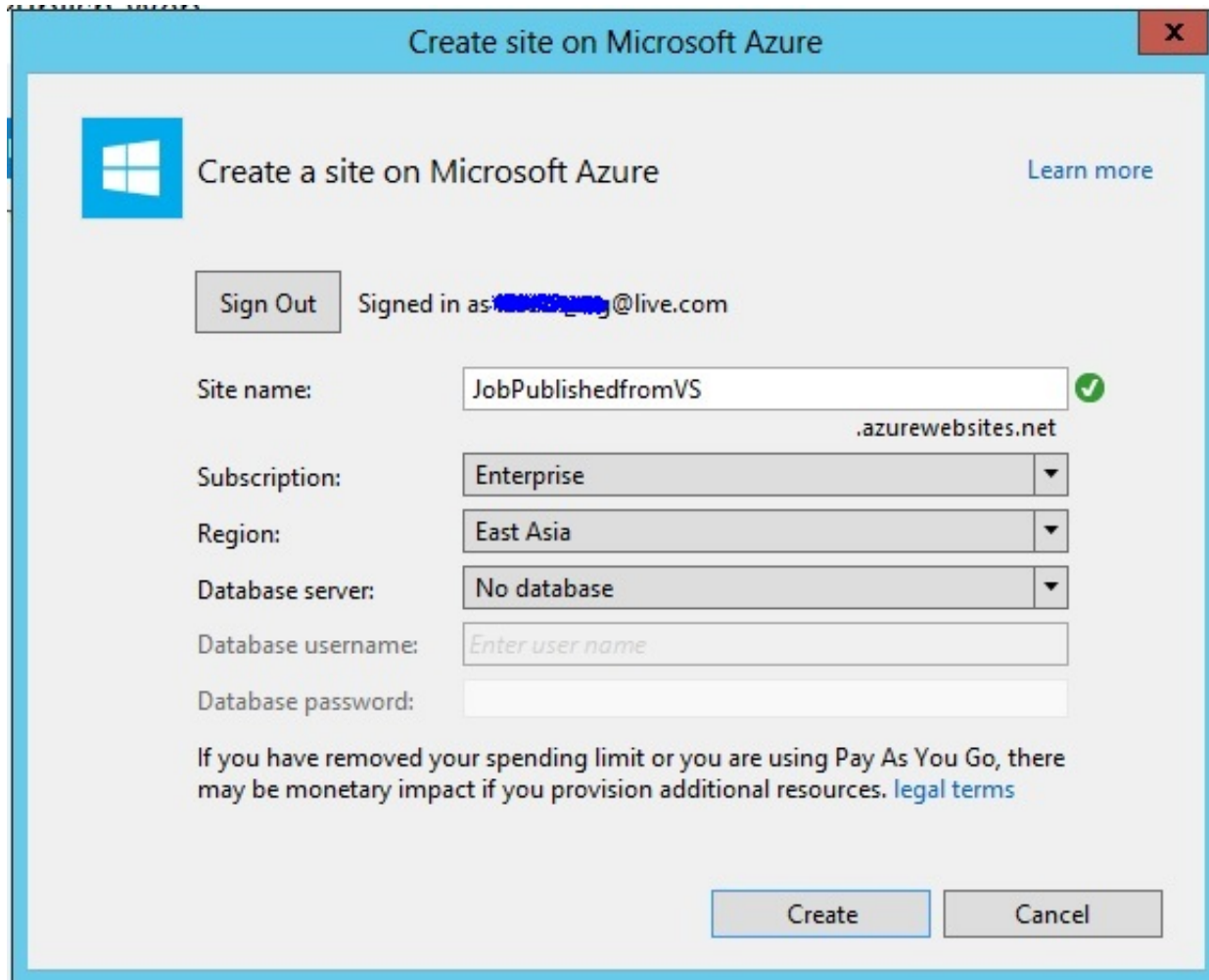


"NEW" button.

d. To create a new website click on the



e. Enter the site name and select the region



Create site on Microsoft Azure

Create a site on Microsoft Azure [Learn more](#)

Sign Out Signed in as: [redacted]@live.com

Site name: JobPublishedfromVS .azurewebsites.net

Subscription: Enterprise

Region: East Asia

Database server: No database

Database username: Enter user name

Database password:

If you have removed your spending limit or you are using Pay As You Go, there may be monetary impact if you provision additional resources. [legal terms](#)

Create Cancel

f. Click "**Create**" button, this will create a new website in Azure.

Publish Web

Profile

Connection

JobpublishedfromVS

Server: jobpublishedfromvs.scm.azurewebsites.net:443

Site name: JobpublishedfromVS

User name: \$JobpublishedfromVS

Password:
☒ Save password

Destination URL: http://jobpublishedfromvs.azurewebsites.net

Validate Connection

< Prev Next > Publish Close

Click the "**Publish**" button to publish the website.

Visual Studio will show the "site published successfully" message.

Output

Show output from: Build

Site was published successfully <http://jobpublishedfromvs.azurewebsites.net/>

Check the job published in Azure portal.

Microsoft Azure

Subscriptions

jobpublishedfromvs

DASHBOARD MONITOR WEBJOBS CONFIGURE SCALE LINKED RESOURCES BACKUPS

NAME	STATUS	SCHEDULE	LAST RUN TIME	LAST RUN RESULT	LOGS
TimerJobUsingAppfroVS	✓ Enabled	Schedule	1/30/2015 10:26:27 AM	Failed	https://jobp

h. The job runs successfully and creates the list in SharePoint site if it does not exists and adds an item every time the jobs runs. Following is the list create by job and tems added by job in the SharePoint site.

DevSite1 EDIT LINKS

My List

+ new item or edit this list

All Items ... Find an item

✓ Title

Testing 2/2/2015 12:11:15 PM ...

Item added by Job at 2/2/2015 7:19:25 AM ...

Item added by Job at 2/2/2015 7:22:09 AM ...

Item added by Job at 2/2/2015 7:26:10 AM 𐄂	...
Item added by Job at 2/2/2015 7:27:05 AM 𐄂	...
Item added by Job at 2/2/2015 7:27:11 AM 𐄂	...
Item added by Job at 2/2/2015 7:28:11 AM 𐄂	...
Item added by Job at 2/2/2015 7:29:12 AM 𐄂	...
Item added by Job at 2/2/2015 7:30:13 AM 𐄂	...
Item added by Job at 2/2/2015 7:31:13 AM 𐄂	...
Item added by Job at 2/2/2015 7:32:15 AM 𐄂	...
Item added by Job at 2/2/2015 7:33:16 AM 𐄂	...
Item added by Job at 2/2/2015 7:34:16 AM 𐄂	...
Item added by Job at 2/2/2015 7:35:18 AM 𐄂	...
Item added by Job at 2/2/2015 7:36:18 AM 𐄂	...
Item added by Job at 2/2/2015 7:37:18 AM 𐄂	...
Item added by Job at 2/2/2015 7:38:20 AM 𐄂	...

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